

Peer Mentoring Styles and Their Contribution to Academic Success Among Mentees: A Person-Oriented Study in Higher Education

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The purpose of our study was to explore peer mentoring styles and examine their contribution to academic success among mentees. Data were collected as part of a comprehensive evaluation of a peer mentoring program. The sample consisted of 49 mentors (advanced students) who supported 376 mentees (first year students) in small groups. Indicators for peer mentoring styles were constructed using mentee assessments of mentoring functions and mentor quality, and unobtrusive data gathered in an analysis of online mentoring activities and a content analysis of the quality of the online mentoring activities. Using cluster analyses, three distinct mentoring styles were identified: Motivating master mentoring, informatory standard mentoring, and negative minimalist mentoring. Motivating master mentors were shown to have a positive influence on success in the mentoring program among those mentees who failed two preliminary exams. Implications for the training of peer mentors in higher education are discussed.

Keywords: mentoring program, mentoring styles, peer mentoring, academic success, higher education, first year students, unobtrusive data, person-oriented approach

Mentoring provides an excellent opportunity for individual professional advancement. Specifically for academic advancement, mentoring programs implemented in the context of higher education have been found to show positive effects for *mentees*, as well as for *mentors* and *universities*. Mentees

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achieve better academic performance (Campbell & Campbell, 1997) and social integration (Allen, McManus, & Russell, 1999). Mentors benefit through the development of personal relationships with students (Eby & Lockwood, 2005) and the satisfaction associated with being a mentor (Treston, 1999). Universities profit from the reductions seen in drop-out rates (Campbell & Campbell, 1997). The outcomes of mentoring programs have often been discussed in the literature, but individual differences in realizing mentoring (mentoring styles) are rarely taken into consideration. In this regard, a person-oriented approach shows promise in the sense that combinations of variables describe groups of individuals. Moreover, there is a lack of research on unobtrusive data (e.g., measure of spent time, frequency of meetings with a mentor) used in identifying different mentoring styles. One reason for this unsatisfactory situation might be that face-to-face mentoring restricts the actions researchers can take in collecting information on unobtrusive parameters, as they often interfere with the mentoring process itself (e.g., the presence of a researcher, the use of recording instruments). In contrast, online mentoring provides an opportunity to collect such data without disruptions.

The aim of our present study was to expand present knowledge on mentoring styles and their contribution to objective success among mentees by focusing on peer blended mentoring, a mentoring format which combines peer mentoring and online mentoring. Our study had two main objectives. The first was to use different indicators of mentoring activities to identify different mentoring styles. The second was to examine how mentoring styles affect the academic success of mentees.

Mentoring Styles in Traditional Mentoring and Peer Mentoring

The outcome of mentoring programs for mentees (e.g., better academic performance, social integration) can be related to how mentors fulfill different mentoring functions. Mentoring relationships are comprised of two major dimensions of mentoring functions: career-related and psychosocial functions (Kram, 1985; Noe, 1988). Career-related mentoring functions include activities such as sponsoring, coaching, and protecting. Psychosocial mentoring functions can be described as role modeling, counseling, and friendship. There is evidence that higher degrees of mentoring functions relate to more satisfaction with the mentoring relationship among the mentees (Allen, Russell, & Maetzke, 1997).

Mentors differ individually in their mentoring styles; i.e., they provide different types of activities (e.g., give assignments) as well as different intensities of support (e.g., give encouragement) and structure (e.g., be goal-oriented). In an exploratory study, Langhout, Rhodes, and Osborne (2004) identified four different mentoring styles in terms of support, structure and activity of a mentoring relationship in youth mentoring. *Moderate* mentors

provide conditional support and moderate levels of activities and structure. *Unconditionally supportive* mentors provide moderate levels of structure and activity and the highest levels of support. *Active* mentors are characterized by the highest levels of activity, but the lowest degrees of structure. *Low-key* mentors provide high levels of support, but show the lowest amount of activity. Langhout et al. (2004) found that the most extensive benefits for mentees are associated with *moderate* mentoring relationships. Higher activity levels are considered to be indicators of higher levels of mentor investment.

In the context of higher education, peer mentoring has proven to be an effective way to support both undergraduate as well as graduate students (Crisp & Cruz, 2009; Hixenbaugh, Dewart, Drees, & Williams, 2004; Jacobi, 1991; Treston, 1999). Compared to more traditional (hierarchical) forms of mentoring, peer mentoring transpires between persons similar in age and hierarchical level, in that more advanced students support first year students. This leads to differences in prioritizing mentoring tasks when compared to traditional mentoring. For example, peer mentors serve more psychosocial functions than career-related functions and provide increased social support (Ensher, Thomas, & Murphy, 2001; Grant-Vallone & Ensher, 2000).

Therefore, the mentoring styles commonly found in traditional (hierarchical) settings (as e.g., Langhout et al., 2004) may not adequately describe those used in peer mentoring situations (Kram & Isabella, 1985). This might well be the case with respect to peer online mentoring, because this mentoring format should have an even higher potential to cross the boundaries of time and space, as well as the barriers of age and hierarchy (Bierema & Merriam, 2002). Within the setting of peer online mentoring, communication between mentor and mentee is transferred to different means, such as email exchanges and discussion boards. The outcomes associated with peer online mentoring programs are likewise positively compared to traditional mentoring. Peer online mentoring has proven to provide support to students (Hixenbaugh et al., 2004) and furnishes feedback and guidance concerning course activities (Del Valle & Duffy, 2009). Furthermore, peer online mentoring is a proven mechanism for increasing social integration (Hixenbaugh et al., 2004).

In addition to the different mentoring styles and structures found in peer mentoring research on mentor characteristics, which are used to identify mentoring styles, methodical weaknesses often surface. In traditional mentoring research, the evaluation of mentor characteristics is primarily based on mentee-ratings which are usually analyzed variable-oriented. Unobtrusive data is rarely collected as the establishment of laboratory conditions (e.g., by video or tape recording) would interfere with the mentoring relationship. Additionally, vague concepts and definitions and a lack of quantitative

research designs impede advancement in mentoring research (Crisp & Cruz, 2009; Jacobi, 1991).

We think that applying a person-oriented approach yields a number of advantages. It directs the focus on the individuals instead of variables (von Eye, Bogat, & Rhodes, 2006). Thus, homogenous groups of individuals, who share similar mentoring styles, can be identified. Moreover, distinct effects of mentoring styles on individuals can be shown, and statements on the frequency distribution of mentoring styles can be made.

We think that within the framework of online mentoring, the mentioned weaknesses can be furthermore diminished to a certain degree. Online mentoring provides the opportunity to record online interactions via log files, which is helpful for the documentation and sustainability of mentoring activities (Ensher, Heun, & Blanchard, 2003; Single & Single, 2005). For example, some studies have investigated interactions between mentors and mentees and their contribution to the effectiveness of online mentoring. Smith-Jentsch, Scielzo, Yarbrough, and Rosopa (2008) compared a chat mentoring condition with a face-to-face mentoring condition. Although there was more interaction between the mentor and mentee in the chat condition than in the face-to-face condition, there were fewer statements related to both psychosocial and career-related mentoring functions in the chat condition. Bonnett, Wildemuth, and Sonnenwald (2006) examined the structure and frequency of interactions in messages sent between mentor-mentee pairs. Mentor-mentee pairs were rated as more effective, by both mentors and mentees, when they had well-structured threads, when mentor and mentee postings were similar in frequency and length, and when mentees were encouraged to be self-dependent.

Until now, and to the best of our knowledge, no previous studies focusing on online mentoring styles have been based on the types of activities provided, or the terms of intensity of support and structure depicted above. However in related research areas, such as online tutoring or online learning, online behavior and interaction data are also being used for analysis. The results of these studies can be summarized as follows: Based on qualitative and quantitative analyses of tutor postings, tutoring styles related to tutor presence during discussions were shown to be stable over time (De Smet, Van Keer, & Valcke, 2008). Based on analyses of online behavior, differences in online learning approaches are mainly distinguished in terms of level of engagement (total online time, number of sessions) and coursework strategies (proportion of time using learning resources, number of messages sent to the tutor) (Del Valle & Duffy, 2009).

The aim of our present study was to expand our knowledge about mentoring styles in peer mentoring and their contribution to academic success among mentees. Our study had two objectives, each with using a person-oriented approach. First, different peer mentoring styles should be identified by using a combination of assessments by the mentees and unobtrusive data

from online mentoring activities. Particularly, we were interested in how the mentoring styles found in peer mentoring correspond to the mentoring styles found by Langhout et al. (2004) in traditional mentoring. Second, we wanted to examine how different mentoring styles affect the academic performance of mentees. So far, research has suggested that participation in mentoring programs improves academic performance (Campbell & Campbell, 1997).

Method

Study Setting

Data were collected as part of an evaluation of the peer mentoring program Cascaded Blended Mentoring (Leidenfrost, Strassnig, Schabmann, & Carbon, 2009) conducted at the University of Vienna, Austria. This mentoring program was run as a voluntary and supplementary course for psychology majors during their first semester; students were assessed regarding the successful completion of the course. The major rationale of the peer mentoring program was to provide the mentees with improved support, aid in orientation and important basic learning skills for higher education (capacity for teamwork, information literacy, and time management).

In the mentoring program, advanced students (mostly fourth year students), *student mentors*, led mentoring groups of 8 to 10 randomly assigned mentees. Student mentors were required to have participated in a two semester seminar for advanced students. During the first semester they were trained in mentoring and tutoring skills in general and in the relevant basic skills, giving feedback and aid to orientation, from both a theoretical and a practical perspective (e.g., time management methods, giving answers to questions of first year students). They also received a manual including guidelines on the structure and content of meetings with mentees, instructions for support for the online mentoring activities and continuing information. During the second semester they supported a group of mentees.

The peer mentoring program was conducted as a blended learning course consisting of online and face-to-face activities for the mentees and thus called for demanded online and face-to-face mentoring activities. The online activities were carried out in an online learning environment which provided learning modules, self-tests, and online exercises which were to be solved individually or in groups. Message boards were used for general and content-related communication in each group. The structure and frequency of face-to-face meetings and the sequence of online modules were predetermined through the program. The duration of the peer mentoring program was 12 weeks; meetings were held between the student mentor and their group of mentees every two to three weeks. During the meetings, the student mentor answered questions concerning the psychology program and

discussed and practiced basic skills with the group of mentees. Overall, a total of five meetings were conducted, the duration of each meeting was about 80 to 90 minutes.

Participants

The number of mentees participating in the peer mentoring program during the winter semester 2007–2008 was 376. The mentees were divided into 49 mentoring groups of about eight persons; each group was assigned to one student mentor.¹ Two hundred and ninety-eight course participants (79%) completed the online survey at the end of the semester. Of this number 80% were female and 20% male, which is representative of the gender distribution in the population of Austrian psychology students ($\chi^2 = .58, p = .45, V = .08, ns$). The median age was 19.9, the age distribution ranged from 18 to 45 with only 10% of the participants being older than 23 years. Sixty-two per cent were Austrian, 33% were German and 5% were of other nationalities.

Measures

Three different types of measures were used: online mentee questionnaires, online mentoring activities by the student mentor, academic performance of the mentees. We next describe the three types of measures in detail.

Mentee questionnaire. In order to gather information on student mentoring functions, the Mentor Functions Scale (Noe, 1988) was used. Additionally, one new item assessed student mentor quality.

Mentoring functions. The Mentor Functions Scale (Noe, 1988) was translated into German (parallel-blind translation) and adapted to the specific situation of student mentor activities. According to Noe (1988), 14 of the 29 items given assess psychosocial mentoring functions, and seven items assess career-related functions. Originally, eight items did not clearly load on either factor. Three items assessing career-related functions did not fit to the student mentor situation and were therefore excluded from the scale. Participants indicated the extent to which the item described their experience in the mentoring program. The answering format employed was a five-point Likert scale, ranging from '1' (*to a very slight extent*) to '5' (*to a very high extent*). Higher scores indicated a more intense provision of the described mentoring function.

In order to examine the factor structure of the Mentor Functions Scale (Noe, 1988) for our study, we conducted an exploratory factor analysis using the principal component method with Varimax rotation in SPSS 15.0. We chose an exploratory approach because the study was administrated in a different context (higher education) than that for which the scale was

constructed (organizational setting), and a German form of the items was used in the present study.

A reliability analysis showed high internal consistency (Cronbach's $\alpha = .93$). Examinations of the eigenvalues and the scree plot clearly indicated a one-factor solution. Three of the remaining 26 items were excluded because of low factor loadings, the resulting 23 items loaded onto one factor.

Assessment of student mentor quality. Student mentor quality was measured with one single item. Participants evaluated the overall quality of their student mentor with grades from one to five ('1' = *excellent*, '5' = *insufficient*), in accordance with the grading system utilized in Austrian schools and universities).

Online activities by the student mentor. Using an online learning environment for mentoring activities provides the opportunity to analyze automatically recorded online interactions. In our study, we took advantage of unobtrusive online behavioral data and performed quantitative and qualitative analyses of online mentoring activities as shown by posted messages.

Online behavior data. The online learning environment enabled the query of accumulated online behavioral data: dates of the first and the last login, total time online, total number of sessions and usage data pertaining to online tools (total number of messages sent and read, total number of tests/tasks filled-in and total duration, total number of folders/files visited). Due to a guarantee of anonymity, it was not possible to gain access to the underlying log files (i.e., records of all activities in the online learning environment).

Here the *number of total sessions* was used as an index for the general frequency of online mentoring activities conducted by the student mentors. The sessions were counted automatically; a session started upon entrance to the online learning environment with a login.

Online mentoring activities. For each group of mentees, a general message board and three content-related message boards, one for each module, were established. All of the student mentor messages which were posted on the four message boards during the semester were collected for analysis. Each message included the name of the student mentor, the given subject, the topic for which it was posted, the date and the time when it was posted, and the content of the message. The following indices resulted from the online mentoring activities:

The *number of messages posted on all group message boards* was used as an index for student mentor involvement with, and responsibility for, their mentees. The *median length of posted messages for the general*

message board was used as an index for the commitment of student mentors to their group of mentees. For median length, the number of characters of each student mentor message was recorded, and then the median number of characters used was calculated for each student mentor. Since the core online mentoring activities occurred on the general message board, only this message board was used in forming this index.

To specify *qualitative indices*, a content analysis was applied to all student mentor messages on the general message boards. The qualitative data analysis tool MAXQDA 2007 (VERBI Software) was used in the content analysis. The 49 student mentors posted a total of 532 messages, with an average of 11 messages per group of mentees. In accordance with content analysis standards (Mayring, 2003), a coding scheme was developed which comprised two categories: direction of online mentoring activity (positive or negative) and content of online mentoring activity (motivational aspects and informational aspects) (see Table 1 for examples). The unit of analysis employed was the representation of a consistent idea. Two independent evaluators achieved an initial agreement rate of 80% regarding categorization. Later, the two evaluators discussed all disagreements through until a consensus was reached. In further analysis, we calculated percentage values of the proportion of categories per student mentor, separately for positive and negative mentoring activities. Because the total number of negative mentoring activities was very low (see “Results”), they were not differentiated according to content. Hence, three indices were built which differentiated the content of online mentoring activities: *Percentage of positive motivational aspects*, *percentage of positive informational aspects*, and *percentage of total negative online mentoring activities*.

Academic performance of the mentees. To gain insight into the development of academic performance of the mentees, we used measures at two different points of time. Before mentoring, results of two preliminary exams were available. After mentoring, mentee success in the peer mentoring program acted as our performance indicator.

Table 1
Categories of Positive and Negative Online Mentoring Activities

	Positive online mentoring activities	Negative online mentoring activities
Motivational aspects	Welcome message, lauding good performance, expressing understanding, invitation to ask questions	Messages with discouraging content, negative writing style
Informational aspects	Reminders for deadlines, providing information without being asked for it, concrete answers to questions, general guidance	Expressing ignorance, questions remain unanswered, giving wrong answers

Results of the two preliminary exams. In the first two weeks of study, psychology students at the University of Vienna are required to take a series of introductory lectures in which are held by a variety of lecturers. The content is examined in two multiple choice exams. The results obtained on these two exams were made available by the university. Grades received on the exams were dichotomized as follows: '1' (*both exam results positive*) and '2' (*at least one negative exam result*).

Mentee success in the peer mentoring program. Mentees were accorded points for the completion of exercises (both individually and in groups) and for attendance in the face-to-face meetings. The scores used were '0' (*not done*) and '1' (*done*). Successful participation in the peer mentoring program is defined as having obtained a minimum of two-thirds of all possible points. The results of the participation assessment were dichotomized as follows: '1' (*successful participation*) and '2' (*unsuccessful participation*).

Procedure

First year students in Winter Semester 2007–2008 ($N = 494$) were contacted per email and invited to participate in the peer mentoring program. Approximately 75% of the first year students enrolled voluntarily. As part of their activities in the course, the mentees agreed to participate in the evaluation of the peer mentoring program, which required them to complete online questionnaires at the beginning and the end of the semester. Furthermore, data generated through the online learning environment was collected over the course of the semester (e.g., number of postings; see above).

Results

We begin our presentation of results with descriptive results for the eight specified indicators. Subsequently, results from cluster analyses to identify mentoring styles are presented. Last, hypotheses on the relationship between mentoring styles and academic performance of mentees are formulated and tested with a configural frequency analysis.

Descriptive Results of Specified Indicators

In this section, means and standard deviations of the eight specified indicators are described. Results are sorted by type of measure: mentee questionnaire and online mentoring activities of the student mentor.

Mentor functions scale and assessment of student mentor quality. On average, the given mentoring functions were positively evaluated by the mentees ($M = 3.54$, $SD = 0.60$). Further, they generally assessed their student mentors with a grade of two ($M = 2.0$, $SD = 0.92$); only five participants assessed their student mentor with a five (*insufficient*).

Online behavior data and online mentoring activities. The number of total sessions ranged between 21 and 494 ($M = 115.98$, $SD = 97.33$). The number of student mentor messages ranged between 6 and 106 ($M = 36.20$, $SD = 19.10$). The median length ranged between 17 and 630 characters ($M = 316.68$, $SD = 113.19$). Ninety-two percent of the online mentoring activities were deemed positive, only 8% were classified as negative. The *percentage of positive motivational aspects* ranged between 0.0 and 100.0 ($M = 53.41$, $SD = 15.43$). The *percentage of positive informational aspects* ranged between 0.0 and 67.0 ($M = 33.48$, $SD = 13.54$). The *percentage of total negative online mentoring activities* ranged between 0.0 and 66.7 ($M = 7.86$, $SD = 12.33$). Variations in the three indicators assessing student mentors (number of student mentor messages, percentage of total negative online mentoring activities) and groups of mentees (assessment of student mentor quality) are shown in Figure 1.

Identification of Mentoring Styles

The first objective of our study was to identify different mentoring styles based on the eight specified indicators (Mentor Functions Scale, assessment of student mentor quality, total number of sessions, number of posted messages, median length of messages posted on the general message board, percentage of positive motivational aspects, percentage of positive informational aspects, and percentage of negative online mentoring activities). Applying a person-oriented approach, we used cluster analyses to examine mentoring styles, thus to look for similar mentoring styles that groups of student mentors possess. Before these analyses, we converted the variable scores into z-scores to better allow for comparisons. In determining outliers, as a first step, a single-linkage cluster analysis was performed (Bergman, Magnusson, & El-Khoury, 2003). One of 49 cases clearly stood out. The mentees in this group gave it very poor scores in the evaluation (Mentor Functions Scale: $M = 1.90$; assessment: $M = 3.88$) and therefore, it was excluded from further analyses. In a second step, a cluster analysis using Ward's (1963) algorithm was computed. According to distance coefficients and theoretical considerations, a three cluster solution was considered to describe the data best. Consequently, three mentoring styles can be distinguished. As a third step, a three-means cluster analysis was computed to determine the most distinct three cluster solution. The mentoring styles based on the three-means cluster solution are displayed in Figure 2. Between-cluster differences were significant for all indicators (see Table 2). Female and male student mentors were equally distributed among the clusters ($\chi^2 = .52$, $p = .77$, $V = .10$, *ns*).

The three groups of student mentors were characterized on the basis of the specified indicators as follows. The first cluster consists of student mentors ($n = 14$) who had high assessment scores and high commitment in

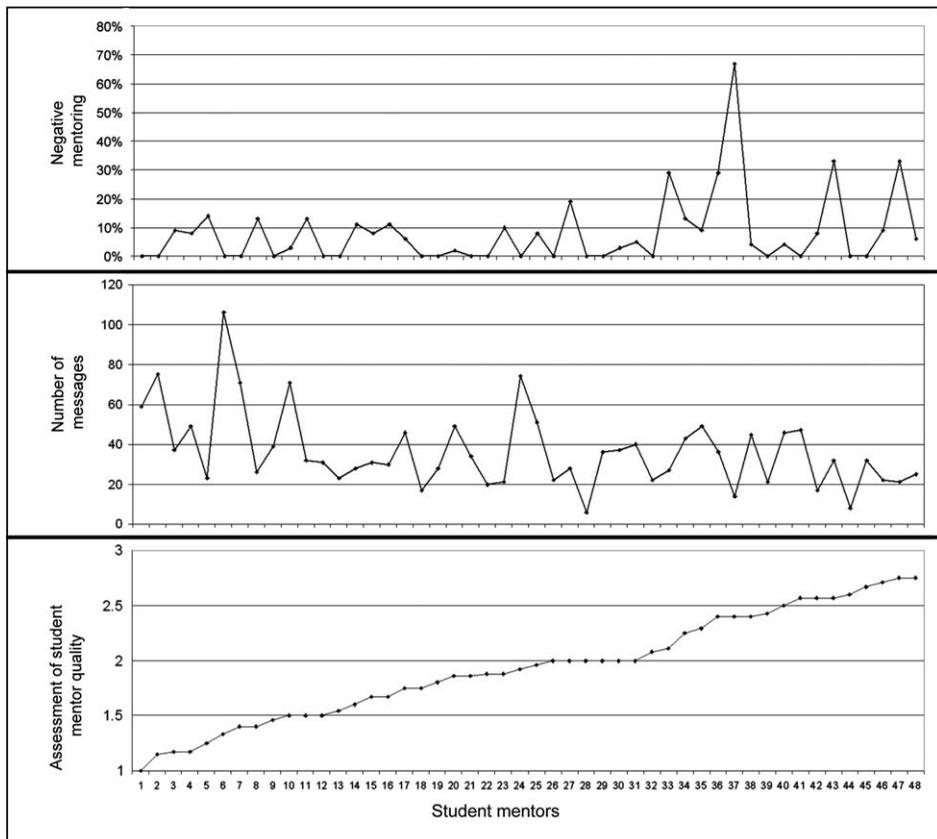


Figure 1. Variations in number of student mentor messages, percentage of total negative online mentoring activities and average assessment of student mentor quality among student mentors.

online mentoring activities (for example the numbers of online sessions and messages on the general message board were nearly twice as high as in the other two clusters, but they only wrote an average of one message every fourth session). The ratio of informational to motivational mentoring aspects stands out. The messages were nearly as motivating as informative, and the percentage of negative mentoring activities was very low, thus the mentoring style is labeled *motivating master* mentoring.

The second cluster consists of student mentors ($n = 30$) whose evaluations and performances turned out average, but the messages they sent were twice as informative as motivating. In comparison to motivating master mentoring, in total they wrote fewer messages in fewer sessions, but they composed one message for every third session, and the average length of the messages was equally large in both mentoring styles. The percentage of negative mentoring activities was also very low. The second mentoring style is labeled *informatory standard* mentoring.

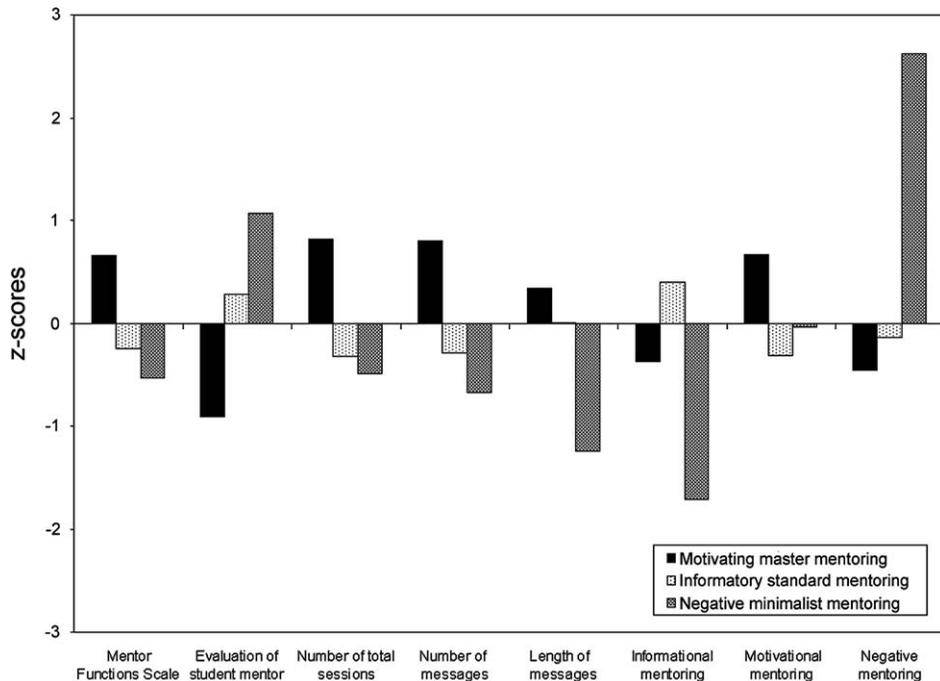


Figure 2. Peer mentoring styles based on 3-means cluster solution.

The third cluster consists of student mentors ($n = 4$) who were graded worst, although they had an acceptable number of sessions and postings. They wrote one message every third session which was comparable to informatory standard mentoring, but the number of characters they used was less than that used in the other two mentoring styles. The percentage of negative mentoring activities in the messages was 16 times higher than that in motivating master mentoring and six times higher than informatory standard mentoring. The third cluster used the same amount of motivating statements, but informational aspects were lacking. Being very minimalistic on the whole, the third mentoring style is labeled *negative minimalist* mentoring.

Are Mentoring Styles Related to the Academic Performance of Mentees?

As our second objective, we examined whether relationships can be confirmed between mentoring styles and the academic performance of mentees ($N = 361$) before (preliminary two exams) and after mentoring (success in participation). Within the framework of psychosocial mentoring functions, mentors fulfill role modeling functions for their mentees (e.g., Kram & Isabella, 1985). Therefore, we expect that mentors who had better evaluations and showed better performances should have had a positive effect on their mentees' academic performances and that mentors who had received poorer

Table 2
Means and Standard Deviations of Indicators of the Three Peer Mentoring Styles

	<i>Motivating master mentoring</i>	<i>Informatory standard mentoring</i>	<i>Negative minimalist mentoring</i>	<i>F(2, 45) (η^2)</i>
Mentor Functions Scale	3.76 _a (0.29)	3.49 _b (0.27)	3.41 _{ab} (0.18)	5.39 (.19)
Assessment of student mentor quality	1.50 _a (0.33)	2.07 _b (0.42)	2.46 _b (0.27)	14.49 (.39)
Number of total sessions	198.14 _a (130.16)	86.60 _b (56.61)	70.50 _b (42.12)	4.95 *) (.18)
Number of messages	51.93 _a (25.91)	30.87 _b (11.08)	23.50 _b (7.77)	6.00 *) (.21)
Length of messages	364.24 _a (132.86)	319.52 _a (123.20)	152.88 _b (105.66)	4.50 (.17)
Informational mentoring	47.48 _a (9.59)	59.48 _b (12.61)	26.59 _c (18.93)	14.62 (.39)
Motivational mentoring	42.57 _a (13.36)	29.14 _b (12.48)	32.94 _{ab} (4.22)	5.50 (.20)
Negative mentoring	2.50 _a (4.21)	6.28 _a (6.81)	40.48 _b (17.60)	10.07 *) (.31)

Note. *F* values refer to ANOVA comparisons for each indicator based on $N = 48$. Means in each column that do not share a common subscript (a, b, or c) differ significantly from one another based on the Bonferroni test with a critical value of $p < .05$. *) Where variances were unequal, *F* values from the Welch test were used.

evaluations and performance scores would have had a negative effect on their mentees' academic performances. Taking into account both of the assessments of academic performance considered so far (preliminary exams and mentoring program participation), we examined the following two hypotheses: (a) more mentees, than expected by chance, who displayed poor academic performance in the first two exams (at least one negative exam result) will have shown a positive result for mentoring program participation if their group was led by a motivating master mentor; and (b) more mentees, than expected by chance, will have shown positive results on the first two exams (both exam results positive) and will not have successfully completed the mentoring program if their group was led by a negative minimalist mentor.

To test these hypotheses, a configural frequency analysis (CFA; Lienert & Krauth, 1975; Spiel & von Eye, 2000) was applied. CFA is a person-oriented multivariate approach which allows analyses concerning typical and atypical variable patterns based on categorical data. Observed frequencies (fo) are compared to expected frequencies (fe) of a configuration. If a configuration occurs more frequently than expected by a chance model, it is identified as a *type*; if a configuration occurs less frequently than expected by a chance model, it is identified as an *antitype*. To compute the CFA, the statistical program developed by von Eye (2000) was used.

We examined a single sample, first order CFA considering the two hypothesized configurations of mentees (motivating master mentoring, at least one negative exam result, successful participation; negative minimalist mentoring, both exam results positive, unsuccessful participation), thus alpha was Bonferroni-adjusted to .025. The motivating master configuration suggests the existence of a type ($fo = 54$, $fe = 38.53$, $\chi^2 = 6.22$, $p = .01$, $RR = 1.40$). In support for the first hypothesis, this configuration indicates that in groups led by a motivating master mentor, more mentees than expected had at least one negative result in the first two exams but nevertheless completed the mentoring program successfully. The negative minimalist configuration was not shown to be a type ($fo = 1$, $fe = 2.39$, $\chi^2 = .81$, $p = .37$, $RR = 0.42$). There was no difference between observed and expected numbers of mentees who had two positive results in the first two exams, but who failed to successfully complete the mentoring program in a group led by a negative minimalist mentor.

Discussion

The first objective of our study was to examine peer mentoring styles and their correspondence to the mentoring styles associated with traditional mentoring. Data were gathered from a peer mentoring program in which advanced students acted as mentors for first year students in face-to-face mentoring as well as in online mentoring activities. The findings indicated three mentoring styles: Motivating master mentoring, informatory standard mentoring and negative minimalist mentoring. The clusters differentiated for all specified indicators.

The second objective of our study was to determine whether mentoring styles were related to the academic performance of mentees. Consistent with the study conducted by Campbell and Campbell (1997), in which the mentees completed more units per semester and received higher grades than non-mentees, the mentoring program showed positive effects on the academic performance of mentees.

Motivating master mentoring was graded best and stood out through high levels of online mentoring activities (twice as many online sessions and two times the number of messages posted than either of the other two mentoring styles) whereas informatory standard mentoring and negative minimalist mentoring were similar in these indicators. Nevertheless, the informatory standard mentors were accorded predominantly average assessments, but sent messages which were nearly as long as those from motivating master mentors. The latter finding suggests that informatory standard mentors did their job quite well (provide mentees with information), but were not as engaged in writing motivating messages to the mentees as the motivating master mentors. Although the negative minimalist mentors composed an acceptable number of messages, indicating that there was least some support, they were

evaluated worst in terms of the given activities. They had the highest percentage of negative mentoring activities. Consistent with Scandura (1998), our findings demonstrate that mentees do not always have positive mentoring experiences. Also, the length of messages can be seen as an objective mark of differentiation between *committed* and *not as committed* mentors, as the negative minimalist mentors wrote the shortest messages.

Our results indicated that motivating master mentoring had a positive influence on poor academic performers, whereas contrary to our expectations negative minimalist mentoring did not exert a systematically negative influence on the success of mentees. So far, our results only relate to a short term measure, namely whether or not the mentoring program was successfully completed. In the long run, it is also important to analyze the long-term effects mentoring styles can have on academic performance.

Comparing our study to Langhout et al. (2004), who identified the four mentoring styles moderate, unconditionally supportive, active, and low-key mentors in traditional mentoring, there were similarities in the inquired research topics (e.g., in frequency and type of activities), but little congruence regarding mentoring styles. Only the moderate mentor identified by Langhout et al. (2004) is comparable to the informentary standard mentoring identified in our study, both rated average in the underlying indicators. Differences in the mentoring styles might be explained by different mentoring settings and methodically different approaches. Langhout et al. (2004) investigated mentoring styles in a traditional mentoring setting whereas our setting was a peer mentoring program. Furthermore, we sought to characterize different mentoring styles by using indicators which were perceived through three different approaches (assessments by the mentees, a quantitative analysis of online behavior data, and a qualitative analysis of online messages sent by mentors) whereas previous research did not include unobtrusive data and was solely based on assessments made by the mentees.

Our data did not support the two-factor structure of mentoring functions which is widely depicted in the literature on mentoring. One explanation might be that three items concerning career-related functions which did not fit the peer blended mentoring setting had to be excluded from the evaluation. We regard this as a first general indicator for differences between traditional and peer mentoring settings. Furthermore, previous research could show that peer mentoring serves more psychosocial functions than career-related functions (Ensher et al., 2001; Grant-Vallone & Ensher, 2000). Hence, it seems reasonable that persons being mentored by peers primarily experience this psychosocial function and, therefore, do not differentiate between the different functions of mentoring.

Our present findings have potential implications for the training of peer mentors for first year students. The results underscore the importance of systematic preparation when training mentors. More than 90% of our student mentors were identified as being either a motivating master mentor or an

informatory standard mentor. Only 8% were accorded negative assessments, as such their mentees experienced negative mentoring activities. Thus, it would be helpful if one could identify negative minimalist mentors prior to the start of a mentoring program, optimally during programs to prepare mentors and develop mentoring skills.

The strengths of our present study are the multi-modal approach to gathering the indicators, the research potential of blended and online mentoring, and applying a person-oriented approach. Access to unobtrusive data in online mentoring is simplified by the availability of communication data recorded during the mentoring process. In contrast to face-to-face mentoring, recording interactions does not interfere with the mentoring relationship itself as it proceeds automatically. By using unobtrusive data, researchers do not have to rely solely on self-reports or evaluation data.

Several limitations to our present study should also be noted. The study was conducted in a particular setting, a course for first year students at only one university. Hence, future research is needed to replicate these results in broader settings. Furthermore, we only considered characteristics and behavioral data concerning mentors. Motivation among the group of mentees could also influence the success of participation in the peer mentoring program. We assumed that mentees were motivated as the mentoring program was optional for the participants. Another influential characteristic which our analysis did not include are the interactions between mentor and mentee and those among the group of mentees. Additional research concerning the perspectives of the mentees as well as their interactions seems warranted.

Due to the organization of the mentoring program, matching between mentor and mentee concerning gender or other similarities could not be realized. Likewise, although it would have been of interest to examine whether poor mentoring is better than no mentoring at all, it was not possible to realize a comparison with a non-mentored control group. Our current study provides a first insight concerning peer mentoring styles applying a person-oriented approach. It was shown that online mentoring provides an excellent opportunity to collect unobtrusive data with ease. Thereby, it was possible to specify indicators for mentoring activities, and based on these, we could identify different mentoring styles. One mentoring style stands out: Motivating master mentoring has a positive effect on mentee participation success. Consequently, specific programs which increase the possibility of turning mentors to motivating master mentors should be developed.

Note

1. Thirty-eight of the student mentors were female, 11 student mentors were male. This proportion is representative of the gender distribution in the population of Austrian psychology students ($\chi^2 = .02$, $p = .90$, $V = .02$, ns).

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